Upper Colorado
Environmental Plant Center
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# NOTICE OF TEE NAMING AND RELEASE OF 'SUMMIT' LOUISIANA SAGE (ARTEMISIA LUDOVICIANA) FOR DISTURBED LAND RECLAMATION

BY THE

UPPER COLORADO ENVIRONMENTAL PLANT CENTER
AND THE
UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE
AND THE
COLORADO STATE UNIVERSITY AGRICULTURAL EXPERIMENT STATION
AND THE
UTAH STATE UNIVERSITY AGRICULTURAL EXPERIMENT STATION
AND THE
UNIVERSITY OF IDAHO AGRICULTURAL EXPERIMENT STATION
AND THE
UNITED STATES DEPARTMENT OF AGRICULTURE - FOREST SERVICE INTERMOUNTAIN RESEARCH STATION

The Upper Colorado Environmental Plant Center, United States Department of Agriculture - Soil Conservation Service, Colorado State University Agricultural Experiment Station, Utah State University Agricultural Experiment Station, University of Idaho Agricultural Experiment Station, and the United States Department of Agriculture - Forest Service Intermountain Research Station announce the naming and release of 'Summit' Louisiana sage [Artemisia ludoviciana, Nutt.] for commercial production and marketing of seed and plants. The strain was selected for its ability to establish on harsh sites, control erosion, and encourage establishment of higher plant forms.

Origin: Identified as EPC 328, 08-00328, T21474, this seed was collected by Jarrell Massey and Glenn F. Carnahan, October 4, 1975, on Georgetown Summit, Bear Lake County, Idaho, elevation 1,909 meters (6,300 ft.) in Major Land Resource Area called Northern Rocky Mountains. It was growing on a gravelly loam soil developed from a deep loess containing limestone or quartz gravel. The soil is deeply leached with its pH ranging from 5.6 to 7.3. The site receives 35 to 40 centimeters of precipitation, two-thirds in the form of snow. The site has a seventy-seven day frost-free period. Minimum winter temperatures sink to minus 38 degrees F (-38 degrees C) and summer warmth reaches 90 degrees F (32 degrees C). January averages 17.6 degrees F (minus 8 degrees C), and the average mean annual temperature is 41.8 degrees F (5.4 degrees C).

Description: 'Summit' Louisiana sage is a herbaceous perennial having a spreading rootstock. Its leaves are not basal but like the stems are wooly pubescent. Leaves are extremely variable from plant to plant, ranging from lanceolate and entire to variously lobed and deeply cleft. 'Summits' upper and lower leaves are often reduced, linear, lanceolate and entire. The middle leaves are elliptic, toothed or lobed mostly 6 to 10 cm long. The stems are 60 to 90 cm tall. Heads are in narrow spike-like or raceme-like panicles. Flowers are numerous and small (3 mm) and the corollas are light brown. Flowers can be self or open pollinated. Fruits are an achene and are present

in all flowers. Flowering begins in early July. Fruits appear in all flowers, maturing after the first hard frost, and shattering moderately soon thereafter. Louisiana sage is quite variable and is credited with a number of subspecies. It is known to form hybrid swarms with other Artemisia ludoviciana (Hulten, 1974). A detailed botanical description of the species and its associated subspecies is contained on pages **585-586** in "Manual of Plants of Colorado" by H. D. Harrington, and "Vascular Plants of the Pacific Northwest", Part V, Page 62-64, by C. Leo Hitchcock.

Occurrence: The subspecies of Artemisia ludoviciana are dispersed extensively. Hulten, 1974, calls it a weed introduced at Bennett, British Columbia and on a circumpolar map shows it occurring from Canada on the north, across western North America into Mexico on the south, and from the Mississippi River on the east to the Pacific coast on the west. Rydberg, 1952, states it's found on prairies, canyons, and mountain sides. Weber, 1976, says it's commonly found from the plains to the subalpine of the southern Rocky Mountains. Native stands are generally found on well drained sites.

Development: 'Summit' Louisiana sage was tested in initial screenings at the Environmental Plant Center near Meeker, Colorado. Its performance has been monitored under irrigation and dryland moisture regimes and seed production has been tested under irrigated conditions. It has been tested at: 1) the Standard Metals mines heavy metal tailing ponds at 9,500 ft. **(2,880** m) near Silverton, Colorado; 2) Colowyo Coal Company at **7,500** ft. **(2,270** m) in Axial Basin, south of Craig, Colorado; 3) Energy Fuel Company at **7,500** ft. (2,270 m) southeast of Hayden, Colorado on coal mine spoils; 4) H and G mine site at **7,000** ft. **(2,120 m)** south of Hayden, Colorado; 5) Curtis Mine with Colorado Mined Land Division at **7,000** ft. (2,120 **m)** south of Milner, Colorado; 6) Fisher Critical Area Treatment planting at **6,500** ft. (1,970 m) south of Durango, Colorado; and, 7) Amax Molybdenum site at 11,200 ft. (3,360 m) near Leadville, Colorado. Seed from the initial collection was used to start plants in the greenhouse. These live plants were then planted in field 14. Sprigs were dug from this block and used to establish a breeders sprig and seed block.

Use: 'Summit' was selected for its 1) outstanding establishment from sprigs; 2) its good establishment from seeding; 3) performance under a wide range of climatic and soil conditions; 4) ability to provide a quick cover reducing erosion on unstable soils; 5) persistent greenness; 6) ability to create a microenvironment suitable for the invasion of other plants; and, 7) ability to produce 60-100 pound seed crops per acre with standard harvesting equipment and techniques. In its performance on slopes of heavy metal tailing ponds, transplants spread rapidly with grasses invading established Louisiana sage plants within three years. 'Summit' has grown successfully in the coarse sands of the heavy metals tailing ponds (often acid) as well as in heavy clay soils (basic). In aspect studies of seeding and transplants, once 'Summit' is established it performs well on all aspects at medium elevations (**6,8,000** ft.). Seeding performance indicated it should be seeded quite shallow, compacted, and the soil stabilized with a light, open mulch. When seeded in a mixture with grasses and forbs it has not dominated or proven competitive. It survives in soil areas where other plants have difficulty. Even though 'Summit' Louisiana sage is consumed by livestock and wildlife (PIN REPORT) it is utilized only on **a** moderate basis and is not considered an attractant. Not only does the plant have the ability to reduce soil erosion but under certain conditions it may improve the soil through nitrogen fixation. Farnsworth, **1975,** observed nodules

the size of a small pea to the size of a quarter on the roots. He observed definite acetylene reduction and has isolated a bacterial organism characteristic of the Rhizobium. He also notes there is much to learn about the system since they have had no success reinfecting and getting nodulation of plants in the greenhouse.

Area of Adaptation: The full range of adaptation of 'Summit' is unknown. It can be concluded that it will perform on poor soil condition sites where moisture is generally above 12 inches and the elevation is about 6,000 ft. Since it originated in southeast Idaho and has been tested throughout the western half of Colorado, assumptions can be made that it will perform in the mountainous areas of Idaho, Wyoming, Colorado, and Utah. Establishment from seed is sometimes difficult since seed must be planted quite shallow and sufficient moisture must be available. Once established, the plant requires little maintenance and expends much energy developing a shallow root system by which it spreads. There are no cultivars of Louisiana sage available in the seed market; consequently, no commercial standard for comparison is available.

Seed and Plant Source: Breeder and foundation seed, and foundation sprigs, will be maintained and produced at the Upper Colorado Environmental Plant Center, Meeker, Colorado. Recognized classes of seed and plants will be breeders, foundation, registered, and certified. Foundation seed and sprigs will be available in 1985 to growers through the Crop Improvement Associations in Utah and Colorado. Standards for all classes of plants and seed will be included in the Utah and Colorado Seed Certification Standards.